

Claims

1. An intraluminally directed anvil apparatus for anastomosing a receiving blood vessel to a graft vessel in conjunction with an anastomosis device, comprising:

anvil means for engaging the intima of the wall of a receiving blood vessel at an anastomosis site, the anvil means being sized for movement within the receiving blood vessel to an anastomosis site, the anvil means having a receiving surface sized to correspond with an end of a graft vessel;

a piercing wire having a proximal end and a distal piercing end, the proximal end extending from the anvil means, and the distal piercing end being configured to pierce the wall of the receiving blood vessel;

positioning means for intraluminally positioning the anvil means at the anastomosis site.

2. The intraluminally directed anvil apparatus recited in claim 1, wherein the anvil means is selected from the group consisting of a laser shield anvil, a soft anvil, a balloon anvil, a combination of a balloon and a puncture resistant balloon sheath, an anvil with abrasion resistant material, an anvil with puncture resistant material, an anvil with distortion resistant material, and an anvil with an effective radiation absorbing material.

3. The intraluminally directed anvil apparatus recited in claim 1, wherein the anvil means has a deflecting surface with depressions therein.

4. The intraluminally directed anvil apparatus recited in claim 1, wherein the receiving surface is slanted.

5. The intraluminally directed anvil apparatus recited in claim 1, wherein the anvil means is attached to the piercing wire.

6. The intraluminally directed anvil apparatus recited in claim 1, further comprising a catheter apparatus that can be positioned in the receiving blood vessel and is configured such that the anvil means can move within the catheter apparatus.

7. The intraluminally directed catheter apparatus recited in claim 1, wherein the positioning means is a wire.

8. The intraluminally directed catheter apparatus recited in claim 1, wherein the positioning means is a hollow shaft.

9. The intraluminally directed catheter apparatus recited in claim 1, wherein the positioning means is integral with the piercing wire.

10. An intraluminally directed anvil apparatus for anastomosing a receiving blood vessel to a graft vessel in conjunction with an anastomosis device, comprising:

an anvil for engaging the intima of the wall of a receiving blood vessel at an anastomosis site, the anvil being sized for movement within a receiving blood vessel to an anastomosis site, the anvil having a receiving surface sized to correspond with an end of a graft vessel;

a piercing wire having a proximal end and a distal piercing end, the proximal end extending from the anvil means, and the distal piercing end being configured to pierce the wall of a receiving blood vessel;

positioning stem for intraluminally positioning the anvil means at the anastomosis site, the positioning stem having a proximal end and a distal control end, the proximal end extending from the anvil, the positioning stem being configured to extend within the receiving blood vessel and out of an opening such that a user can intraluminally position the anvil by the distal control end.

11. An intraluminally directed anvil apparatus for anastomosing a receiving blood vessel to a graft vessel in conjunction with an anastomosis device, comprising:

a balloon anvil for engaging the intima of the wall of a receiving blood vessel at an anastomosis site, the balloon anvil being sized for movement within a receiving blood vessel to an anastomosis site, the balloon anvil having a receiving surface sized to correspond with an end of a graft vessel;

a piercing wire having a proximal end and a distal piercing end, the proximal end extending from the anvil means, and the distal piercing end being configured to pierce the wall of a receiving blood vessel;

positioning stem for intraluminally positioning the anvil means at the anastomosis site, the positioning stem having a proximal end and a distal control end, the proximal end extending from the anvil, the positioning stem being configured to extend within the receiving blood vessel and out of an opening such that a user can intraluminally position the anvil by the distal control end.